Ginger Root

Economic Fact Sheet #19
January 1993

Department of Agricultural and Resource Economics
College of Tropical Agriculture and Human Resources
University of Hawaii

By
Kulavit Wanitprapha, Stuart T. Nakamoto,
and Dwight M. Sato

CROP PROFILE

SPECIES AND CULTIVARS

- Ginger (*Zingiber officinale* Roscoe) is the root, or rhizome, of an herbaceous perennial plant. Ginger is usually cultivated as an annual crop and is widely grown in many tropical and subtropical countries.

- There are many varieties of edible ginger grown worldwide. Other species are commercially grown for ornamental flower production, e.g., red, white, and yellow gingers.

- Ginger varieties are often named after the places where they are grown. Gingers from different geographical areas tend to have distinctive flavors, appearances, and other quality attributes, such as rhizome size, yield, fiber, moisture, and oil content. Different varieties are better suited for producing different products.

- Wynad Manantody is the most widely grown cultivar in Kerela, India's main producing state. Other varieties cultivated for their high yields are Maran, Karakkal, and, from Brazil, Rio de Janeiro (primarily grown for the fresh market).

- Chinese ginger is the type commercially cultivated in Hawaii. It has a large rhizome, light yellow flesh, is less pungent, and has high yields.

- Hawaii fresh ginger is known for superior quality compared to ginger of foreign origin. It has large plump hands, and smooth, shiny attractive skin.

PRODUCTIVITY

- Ginger is propagated by pieces of the rhizome. In Hawaii, mature ginger is harvested 10–12 months after planting. Harvesting can be done manually or mechanically. After harvest, the rhizomes are washed, trimmed, and dried indoors on wire-screened racks for four to six days before being packed and shipped.

- The optimal soil type for ginger is a deep, rock-free, well-drained soil with high moisture-holding capacity and a pH of 5.5 to 6.5. In Hawaii, ginger is grown at elevations between 100 and 1000 ft in the Hilo and Hamakua districts.

- Crop yields vary according to environmental conditions and management practices. The average yield for ginger in Hawaii is about 40,000 lb/ac, but yields of up to 70,000 lb/ac are possible. In India, the average yield for important cultivars is between 13,350 lb/ac and 18,700 lb/ac.

- Sprouting is a major postharvest problem for fresh ginger. Ginger can be stored for up to six months at a temperature of 55°F with 65% relative humidity, but with an unacceptable weight loss. Other problems include decay, physiological breakdown, surface shriveling, and discoloration.

- The major diseases of ginger in Hawaii include root-knot nematode, red-rot, alligator skin, fusarium yellows, and bacterial wilt. Chinese rose beetle and lesser cornstalk borer are the important insect pests that affect ginger.

PRODUCTS AND USES

- Fresh ginger (also called green ginger), preserved ginger in syrup or brine, and dried ginger spice are the three major forms of the ginger

rhizome traded on the world market. Fresh ginger, harvested mature, is used as a spice. Immature low-fiber rhizomes are used for making preserved ginger. Mature rhizomes are used for the preparation of dried ginger, the major product or form of trade.

- For dried ginger production, the preferred varieties have low fiber and low moisture content, giving them high a percentage of dry ginger yield. The pungency of ginger is due to the presence of oleoresin (gingerol), and the aromatic fragrance is from the essential oil in the rhizomes.

- To obtain dried ginger, the rhizomes are typically harvested eight to 10 months after planting, washed, peeled, and sun-dried for four to five days. They are traded either in whole, piece, or ground forms. Yields of dried ginger in India range from 15% to 25% of the fresh weight.

- Excluding ginger preserved in brine (an intermediate product or raw material for the preserving industry), preserved ginger in sugar syrup and dry or crystallized ginger are classified as preserved ginger in the commercial trade. Rhizomes usually are harvested seven months after planting for production of preserved ginger. In Australia, ginger is stored in brine until needed for processing.

- Ginger oleoresin is obtained by solvent extraction of dried ginger. Yields of up to 20% have been reported. This product has the aroma, flavor, and pungent properties of the spice and is used in flavorings, foods, beverages, and pharmaceutical formulations.

- Ginger oil has the aroma and flavor of the spice but without the pungency. Yields of 1–3% are obtained by steam-distilling dried ginger. The oil is used mainly in flavoring beverages and also in the perfumery and confectionery industries.

- Ginger is used for various medicinal purposes, such as for nausea, indigestion, and cold symptoms. It is also used to make beverages such as ginger tea, ginger beer, and ginger wine. Ginger powder, paste, pickles, candy, and other processed forms are also produced.

WORLD SUPPLY AND DEMAND

- The total world production figure for ginger is unavailable. Large amounts are consumed in the producing countries. In 1988, India, the largest producer and major exporter, produced more than 338 million lb of ginger. Most of the exports were in dried and powdered forms. Small quantities of ginger oil and oleoresin were also exported.

- The estimated 1988 production area in India was 133,900 acres, compared to 16,000 acres in Bangladesh, 365 acres (1984) in Fiji, and 165 acres (harvested) in Hawaii.

- Besides India, China, Jamaica, Sierra Leone, and Nigeria are important producers of dried ginger. Jamaican dried ginger is considered to be of high quality with a unique flavor and aroma and good appearance. Oil from Jamaican dried ginger is widely used in flavoring soft drinks.

- Major markets for dried ginger are Saudi Arabia, Yemen, the United States, Canada, the United Kingdom, the Federal Republic of Germany, France, and Japan.

- Australia and Hong Kong are major producers of preserved ginger: ginger in syrup and crystallized ginger. In 1991, Hong Kong exported 2.6 million lb of ginger preserved in syrup, 3.8 million lb of ginger preserved dry, and 95,900 lb of crystallized ginger. Most of the ginger preserved dry was re-exported.

- Certain countries in Asia, the Caribbean, Central and South America, and the Indian and Pacific oceans are major exporters of fresh ginger. Asia is also the main market for fresh ginger, where it is extensively used in cooking. In the United States, Canada, and Western Europe, Asian communities are the main consumers of fresh ginger.

- Ginger production in Taiwan declined sharply, from 115.2 million lb in 1982 to 53.5 million lb in 1990. In the early 1980s, Taiwan was one of the largest exporters of ginger. In 1982, exports of pickled ginger were 52.7 million lb, but by 1990, exports were reduced to only 4.9 million lb. Competition from the low-cost Asian countries was one of the main reasons for the decline.

- Indonesia is the largest exporter of fresh ginger in Asia and perhaps in the world, with about 99.3 million lb of exports in 1991. Its top buyers were Singapore (20.9% of the total exports), Malaysia (20.4%), Japan (15.2%), Hong Kong (13.5%), and the United Arab Emirates (13.1%). The average export price (FOB) was 18.5¢/lb.

- Thailand is also a major exporter of ginger. In 1991, Thailand exported 22.4 million lb of gin-

ger. Pakistan received more than 65% of the volume exported. Other markets for Thai ginger were Japan (11.7% of the total volume), Hong Kong (9.5%), and the United Kingdom (5.2%).

- Singapore and Hong Kong are major transshipment centers in Asia. In 1991, Singapore exported 10.2 million lb of fresh and dried ginger, mostly re-exports. The top three destinations were Pakistan (36.1% of total exports), Hong Kong (16.2%), and Malaysia (12.6%).

- In 1991, Hong Kong exported 4.2 million lb of fresh ginger, of which 98.5% were re-exported. Major destinations were Japan (41.5% of total exports), Taiwan (32.4%), and South Korea (19.4%).

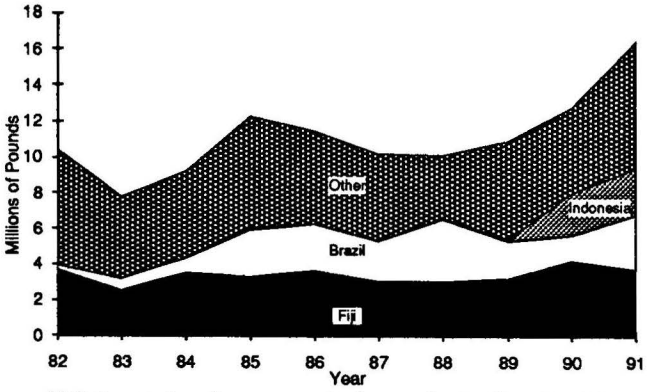
SELECTED MARKETS

THE UNITED STATES

- In 1991, the United States imported 18.8 million lb of ginger products at a CIF (cost, insurance, and freight) value of $13.7 million. Unground ginger (including both fresh and dried products) was the largest group of imported ginger products.

- Imports of unground ginger increased from 10.5 million lb in 1982 to 16.4 million lb in 1991. Domestic (Hawaii) production grew from 3.6 to 12 million lb over the same period. The major foreign suppliers of unground ginger were Fiji (22.8% of the foreign imports), Brazil (18.9%), Indonesia (15.7%), India (12%), and China (10.9%).

- Most, if not all, of the ginger imported from Brazil, Fiji, and Indonesia may be the fresh form. Other foreign suppliers of fresh ginger include Costa Rica, Taiwan, and Thailand. Imports from Indonesia and Brazil have grown at a tremendous rate in the last decade.



U.S. imports of unground ginger (including fresh), 1982–91

U.S. imports of ginger products, 1991

Product	Quantity (1000 lb)	CIF Value ($1000)
Unground ginger (incl. fresh and dried)	16,418	10,232
Ground ginger	1,559	2,138
Candied ginger	569	938
Sweet ginger	262	352

- The supply of fresh ginger root in the U.S. mainland market is seasonal. Hawaii ginger, the largest supply, dominates the market from winter to late spring. Fijian ginger is available from late summer to early winter. Ginger from Brazil and Costa Rica arrives during the summer months to early winter.

- India and Taiwan supplied more than 91% of the total quantity of imports of ground ginger in 1991. Australia (43.1%), Thailand (30.2%), and Taiwan (17.9%) were the major suppliers of candied ginger. Forty-seven percent of the volume for sweet ginger came from Hong Kong.

ASIA

- Hong Kong, Malaysia, and Singapore are major importers of fresh ginger in Asia. In 1991, Hong Kong imported 20.9 million lb of fresh ginger. Indonesia, China, and Singapore accounted for 88% of the supply. In the same year, 3.5 million lb of ginger preserved dry, 3.3 million lb of ginger in temporary preservative, 2.7 million lb of dried ginger, 836,800 lb of ginger preserved in syrup, and 4880 lb of crystallized ginger were also imported. China was the main supplier.

- In 1990, Malaysia imported 14.7 million lb of ginger, with 90% coming from Indonesia. Singapore imported 6.3 million lb of fresh and dried ginger in 1991. Malaysia supplied 61.2% of the total imports. Ginger traded between Indonesia and Singapore is not officially recorded, but in 1991 Indonesia shipped more than 20.8 million lb of fresh ginger to Singapore.

- In Japan, the total production of ginger roots and sprouts in 1988 was about 101.5 million lb and 14.7 million lb, respectively. Fresh ginger roots are used mainly as a spice, and fresh ginger sprouts are eaten as a relish.

- In 1991, Japan imported 104.5 million lb of preserved ginger, up 29% from 1986. Thailand supplied 80.8% of the total quantity imported,

followed by China (7.1%) and Indonesia (4.9%). In the same year, Japan also imported 29.9 million lb of unground ginger and 1.8 million lb of ground ginger. China and Indonesia were the major suppliers for unground ginger.

- The retail price for ginger roots in Japan was about $3.29/lb in 1989, and ginger sprouts retailed for around $4.28/lb. Sales of pickled ginger are increasing dramatically, due to the expansion of take-out food chains.

WESTERN EUROPE

- In 1989, the European Community (EC-12) imported 20.5 million lb of ginger (fresh and dried), 1.7 million lb of preserved ginger, and 8.9 million lb of sugar-added ginger. The United Kingdom accounted for about 53.7% of the fresh and dried ginger imported in 1989, followed by the Netherlands (18.9%), the Federal Republic of Germany (13.7%), and France (9.6%).

- Brazil, China, Costa Rica, Nigeria, and the United States were the major foreign suppliers of fresh and dried ginger in 1989. Australia was the largest supplier of preserved ginger. Hong Kong, Australia, and China were the top three suppliers of ginger with sugar added.

GINGER IN HAWAII

- "Ginger Root Production in Hawaii," Commodity Fact Sheet GIN-3(A), published by HITAHR, provides information on horticultural practices. Topics covered include propagation and cultural practices, irrigation, fertilization, and harvesting.

- The Hilo and Hamakua districts on the Big Island are major commercial production areas of ginger in Hawaii. Ginger production has been increasing constantly over the past 20 years. In 1992, the total production was 7.5 million lb, valued at $4.1 million, a 37.5% decrease from the record crop in 1991. Hawaii ginger is marketed as fresh ginger.

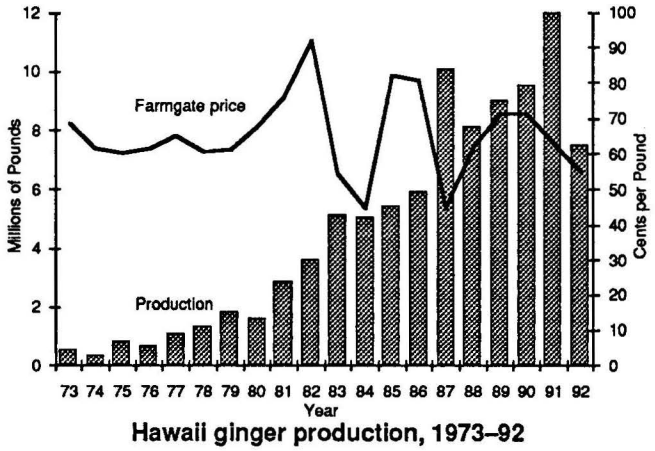
- The average farmgate price for ginger root in 1992 was 55¢/lb, down 8¢/lb from the previous year. The Honolulu wholesale price range for Hawaii No. 1 fresh ginger in 1991 was 90–145¢/lb. During the same year, the wholesale price for Fijian fresh ginger ranged from 90 to 125¢/lb.

- According to the most recent cost-of-production study for ginger, based on practices described in GIN-3(A), a four-acre ginger farm with one acre-crop harvested annually would have an annual operating cost (excluding ownership and land costs) of $15,300. Packing costs accounted for 23% of the total operating costs, followed by land preparation (18%), overhead (13%), harvesting (13%), and fertilizing (12%).

- The majority of ginger production is exported to the U.S. mainland, the main market for Hawaii ginger. Other markets include Canada and Europe. Hawaii also imports fresh ginger from Fiji. In 1991, 310,000 lb were inshipped, of which 93.5% came from the foreign countries, with the remainder from the U.S. mainland.

- In 1991, Hawaii air-freighted over 49,000 lb of ginger, valued at $63,200, directly to Canada. In the same year, according to U.S. Department of Commerce data, about 33,800 lb, with a value of $47,500, were exported directly to Europe.

- Seasonal oversupply in the mainland market is a problem for the Hawaii ginger industry. The industry analysis suggested three approaches to market stability: in-field storage via the use of growth inhibitors; postharvest storage in a controlled-atmosphere unit, which would extend life and availability to year-round; and the creation of new products using lower grades.



Hawaii ginger production, 1973–92

Reference to a company or product name does not imply approval or recommendation of the product by the College of Tropical Agriculture and Human Resources, University of Hawaii. Research for this publication was funded by the Agricultural Diversification Project, administered by the USDA.

Hawaii Agricultural Experiment Station, HITAHR, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa. Noel P. Kefford, Director and Dean.

A list of references is available from the authors upon request.